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Dividend Policy, Corporate Control and Tax Clienteles The Case of Germany

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Abstract:
This paper studies the impact of the concentration of control, the type of controlling shareholder and the dividend tax preference of the controlling shareholder on dividend policy for a panel of 220 German firms over 1984-2005. While the concentration of control does not have an effect on the dividend payout, there is strong evidence that the type of controlling shareholder matters as family controlled firms have high dividend payouts whereas bank controlled firms have low dividend payouts. However, there is no evidence that the dividend preference of the large shareholder has an impact on the dividend decision.

JEL Classification: G32, G35

Keywords: Dividend Policy, Payout Policy, Lintner Dividend Model, Tax Clientele Effects, Corporate Governance

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1. Introduction

There exists a vast body of empirical research on the dividend behaviour of US and UK corporations. However, much less is known about the dividend policy of firms based elsewhere. The literature is even sparser on the link between dividends and control across the world. This is highly surprising given that theory predicts that there should be such a link.

In addition to the absence of a large body of literature, the only two cross-country studies on the link between dividend policy and control – La Porta et al. (2000) and Faccio et al. (2001) – have both considerable limitations in terms of the measurement of corporate control. While La Porta et al. (2000) use the quality of law which is correlated with the average concentration of control in a country, they do not directly measure corporate control at the level of the individual firm. In contrast, Faccio et al. (2001) measure control at firm level. However, while they account for the fact that control over a firm may be held indirectly, via e.g. pyramids of ownership, they make the fairly strong assumption that any unlisted firm holding a stake in one of their sample firms is family controlled. Hence, their study likely overestimates the importance of family control in countries where other types of large shareholders also hold control indirectly. Our study suggests that Germany is one of these countries. In addition, neither study adjusts for the tax status of the controlling shareholder which may also affect the dividend payout.

Our study purports to address these two limitations by investigating the impact of *actual* ultimate control as well as the tax status of the controlling shareholder on the dividend payout for the case of German firms during 1984-2005. Germany is a rich laboratory for the study of the effects of control on dividends as there are sizeable percentages of both firms with concentrated control in the hands of families, banks or other corporations and firms that are widely held. In contrast, given the dispersion of control in the UK and the US studies on those countries are typically only able to analyse the impact of managerial and relatively small institutional stock holdings on the dividend policy. In addition, our study also adjusts for country-specific characteristics that are normally omitted in cross-country studies. These

characteristics include the existence of guaranteed dividends on preference stock, so called ‘specially designated dividends’ and ‘control agreements’ that are frequently in place in firms controlled by other firms. Hence, if there is a link between control and dividend policy our study is well equipped to detect it.

While we find that the concentration of control as such does not have an impact on the dividend payout, we find strong evidence that the type of controlling shareholder has an influence on the dividend. In particular, our results suggest that firms controlled by families have significantly higher dividend payouts while those controlled by banks have lower payouts than all other firms. This result persists even if we adjust for the tax status of the controlling shareholder. Surprisingly, family controlled firms pay higher dividends even though families have a preference for capital gains rather than dividends.

The paper is organised as follows. The next section reviews the literature on the link between control and dividend policy, discusses the German tax system and develops hypotheses on the impact of control, the type of controlling shareholder as well as the tax status of the latter on the dividend payout. Section 3 focuses on sample and other data issues as well as the measurement of control. The following section discusses the descriptive analysis. Sections 5 and 6 are about the multivariate analysis, focusing on the methodology and the estimation results, respectively. Finally, Section 7 concludes the paper.

2. Literature Review and Hypotheses

This section reviews the theoretical and empirical literature on the relation between dividend policy and ownership and control. Based on this review, we develop a series of testable hypotheses about the impact on dividend policy of the concentration of control, the type of controlling shareholder and the tax preference for dividends of the controlling shareholder.

2.1 The concentration of control

The separation of ownership and control gives rise to an agency problem as the interests of the agent (manager) may diverge from those of the principal (provider of

finance) (Jensen and Meckling 1976). A high dividend payout ratio is then one way of mitigating the agency problem as it increases the likelihood that the firm has to raise outside financing on a regular basis, thereby subjecting itself to outside monitoring (Easterbrook 1984). According to Rozeff (1982), another way of reducing the agency problem is the monitoring performed by a large shareholder. This monitoring is likely to align the interests of the managers with those of the shareholders. Hence, concentrated ownership and control may reduce the need for dividends. In support of his prediction, Rozeff (1982) finds that firms have higher payout ratios when insiders hold a lower fraction of the equity and/or there is a greater number of shareholders. Several other studies (e.g. Crutchley and Hansen 1989, Dempsey and Laber 1992, Moh'd, Perry and Rimbey 1995) provide evidence consistent with Rozeff's prediction.

Easterbrook (1984) theorises that high dividends are used as a self-disciplining mechanism forcing the firm to raise outside equity, thereby facing the scrutiny of outsiders such as financial analysts and journalists. Born and Rimbey (1993) find support for this. Hence, concentrated control and high dividend payouts may be alternative monitoring mechanisms. This leads us to our first hypothesis.

H1: There is a negative linear relationship between the dividend payout and the concentration of control.

However, Morck et al. (1988) argue that, once control exceeds a certain threshold (the point of entrenchment), the controlling shareholder will have uncontested control and may be tempted to expropriate the minority shareholders. According to Schooley and Barney (1994), beyond this threshold there may be a need again for high dividends. In line with this argument, Schooley and Barney (1994), Hamid et al. (1995) and Crutchley et al. (1999) test whether there is a non-linear relationship between dividends and insider, i.e. management ownership. They find support for this in the form of a convex relationship between insider ownership and dividend yields. While the danger of minority shareholder expropriation is particularly severe in corporate governance systems such as Germany given the significant number of firms that are controlled by families or other large shareholders, Faccio et al. (2001) nevertheless find evidence that Western European firms, where expropriation of minority

shareholders is more likely, pay higher dividends than other firms. All of the above discussion suggests a non-linear relationship between control and the dividend payout and leads us to our second hypothesis.

H2: The relationship between dividends and concentration of control is at first downward sloping over some initial range of control and then upward sloping.

2.2 The type of controlling shareholder

Whereas the above two hypotheses refer to control without taking into consideration the identity of the controlling shareholder, an emerging body of the literature deals with the impact of various types of large shareholder on dividend policy (e.g., Gugler 2003, Perez-Gonzales 2003, Goergen et al. (2005) and Barclay et al. 2008). Distinguishing between the types of large shareholder may be important as different types are likely to provide different degrees of monitoring. In particular, it is worth distinguishing between the following three types of shareholder: families or individuals, banks and other corporations.

A controlling stake in the hands of a family or individual rather than a corporation may give rise to the expropriation of minority shareholders. Connelly et al. (2010) review the empirical research on the influence of family shareholders on shareholder value. They find empirical support for the prediction that family shareholders expropriate minority shareholders. As a result, small shareholders may only be willing to invest in firms controlled by families or individuals if they receive a higher dividend payout. An alternative reason why firms controlled by families may pay higher dividends is the family's liquidity needs. Dividends are a way for the family to generate "hard cash" without having to give up the control over their firm.

H3: Firms controlled by families pay higher dividends.

A second type of large shareholder is industrial and commercial corporations which in turn have their own shareholders. Therefore, they may themselves be subject to agency conflicts and be less effective monitors than other types of large shareholder. Hence, for such firms there may be a need for high dividends.

H4: Firms controlled by other corporations have higher dividend payouts than firms controlled by other types of large shareholder.

Accounting for control by banks is particularly appropriate given the alleged corporate governance role played by banks in Germany. The traditional view presented *inter alia* by Correia da Silva et al. (2004) is that long-term relationships between firms and banks (in their role as creditors and owners of equity) alleviate agency costs and asymmetries of information between outside investors and managers. Hence, the need for costly dividends is likely to be lower in firms controlled by banks.

However, the evidence as to the impact of bank monitoring and, in particular, the link between bank control and firm value remains inconclusive. For example, Chirinko and Elston (1996) do not find a robust positive effect of bank influence on profitability. Furthermore, while their study is the only one that investigates the impact of bank control on dividend policy, they do not find that bank influence has any effect on dividend policy. In contrast, Cable (1985) and Gorton and Schmid (2000) find a positive effect of bank involvement on financial performance. Hence, the evidence as to the impact of banks on dividends and performance is still out there. This leads us to our next hypothesis.

H5: Bank control is associated with lower dividend payouts.

Apart from their monitoring incentives, the types of large shareholder also differ in terms of their tax preference for dividends as compared to capital gains. We shall discuss the tax preference of the various types of shareholder in the following sub-section.

2.3 The tax preference for dividends of the controlling shareholder

This sub-section describes the German tax system from 1977 until 2005 and determines the tax preference for dividends of the various types of shareholder. It also develops two hypotheses based on the tax status of family shareholders and corporate shareholders.

Until the year 2000, Germany operated a split-rate corporate tax system under which retained profits were taxed more heavily than distributed profits (see Table 1). From 1991 onwards, both retained and distributed profits were also subject to a so-called

'solidarity surcharge', which affected both tax rates equally.[1] Still, there was an additional tax on distributed profits (i.e., dividends): a 25 per cent withholding tax was deducted at source from the dividends paid to shareholders. However, both the corporate tax rate on distributed profits and the withholding tax (including the 'solidarity surcharge') could be *fully* claimed by shareholders as a tax credit against their income tax liabilities. Hence, Germany operated a full imputation system of taxation until 2001.

[INSERT TABLE 1 ABOUT HERE]

The 2001 tax reform replaced the imputation system by the so-called 'half-income system' ('*Halbeinkünfteverfahren*'). Retained profits and dividends are no longer taxed at different rates and now incur the same rate of 26.4 per cent (25% plus the 'solidarity surcharge' of 5.5%, increasing the rate to 26.4%) at the corporate level.

Formally, a gross dividend of Deutsch Mark (DM) 1 (including the tax credit received for corporate tax (plus the 'solidarity surcharge') on distributed earnings) was worth $(1\text{-}t_s) - t_s t_{ss}$ to an individual shareholder, where t_s stands for the shareholder's income tax rate and t_{ss} for the 'solidarity surcharge'. The tax discrimination variable (for the period prior to 2001), measuring the preference of dividends over capital gains, is equal to:

$$TAX = \frac{(1-t_s)-t_s t_{ss}}{\left((1-t_r)-t_r t_{ss}\right)\left((1-t_g)-t_g t_{ss}\right)} \quad (1)$$

where t_r stands for the corporate tax on retained earnings, and t_g for the capital gains tax rate. A shareholder has a preference for dividends over capital gains if the tax discrimination variable TAX exceeds 1.

In what follows we examine the tax status of three types of large shareholder: (i) individuals (ii) corporations (i.e., industrial and commercial firms, as well as banks

[1] The 'solidarity surcharge' ('Solidaritätszuschlag') is a surcharge on corporate and personal earnings and was introduced in order to meet the costs of the German reunification. The surcharge is currently 5.5 per cent.

and insurance companies), and (iii) foreign investors. In addition, we also examine the tax status of firms that are widely held.

(i) *Individuals*. The top tax rate on personal income (i.e., t_s) in Germany varies from 48.5 per cent to 56 per cent during 1977 and 2005 (see Table 1). There is no personal capital gains tax (i.e., $t_g = 0$) provided that shares are held for a minimum period (i.e., 6 months until 1998, and 12 months thereafter). For shares held for less than the minimum period, the realized capital gains are added to an individual's taxable income. If we assume that the shares are held for at least one year, the tax discrimination variable reduces to:

$$TAX = \frac{(1-t_s)-t_s t_{ss}}{((1-t_r)-t_r t_{ss})} \tag{2}$$

Thus, the tax preference for dividends compared to capital gains depends on the marginal income tax bracket of the shareholder. Under the imputation system (i.e. before 2001), we need to consider two categories of individuals:

a. Individuals whose marginal income tax rate is lower than the corporate tax rate on retained earnings and capital gains are not realized within 6 months (12 months after 1998). This type of investor prefers dividends over capital gains.

b. Individuals whose marginal income tax rate is above the corporate tax rate on retained earnings have a tax preference for long-term capital gains.

Under the new system, one half of the dividend is taxed at 26.4 per cent as in previous years, and the other half is now taxed twice, at the personal and corporate level. Therefore, for individuals the effective tax rate exceeds the tax rate of 26.4 per cent incurred on retained earnings (see Table 1). Since capital gains are still tax-exempt (on stock held for more than 12 months), individuals prefer capital gains over dividends even if they are in the lowest tax bracket.[2] The tax discrimination variable for individuals is now as follows:

$$TAX = \frac{(1-t_d)-t_d t_{ss}-((1-t_d)-t_d t_{ss})0.5t_s(1+t_{ss})}{(1-t_r)-t_r t_{ss}} \tag{3}$$

[2] The tax system changed again in 2009.

As controlling shareholders are wealthy individuals, their annual taxable income will most likely exceed DM 102,000 (the threshold in place for being taxed at the highest income tax rate at the end of our sample period). Consequently, domestic individuals are assumed to be taxed at the highest income tax rate (for details see Table 1). Furthermore, we assume that individuals hold their large share stakes for a long period of time (at least 12 months) such that capital gains tax, t_g, is zero. Plugging these values into equations (2) and (3), we obtain that the tax discrimination variable (*TAX*) for this type of investor is always below 1. Hence, individuals prefer long-term capital gains over dividends. This discussion leads us to our first hypothesis on the effect of the tax status of the type of large shareholder on dividend policy.

H6: Given the preference of families and individuals for capital gains, firms controlled by families or individuals have lower dividend payouts.

(ii) *Corporations.* Before 2001, corporate investors (similar to individuals) received the dividend plus a credit which amounted to their corporate tax liability. Consequently, when receiving the dividend, they did not pay any tax. However, the dividend received increased their taxable income. Under the new system, dividend payments to corporations were tax-free until 2004. However since 2004, 5 per cent of the dividend payment have had to be declared as revenue and have therefore been subject to corporate tax. Since capital gains from the sale of shares held in another company are also tax-exempt under the new system, corporations are indifferent between retained and distributed earnings between 2001 and 2004 with a slight preference for capital gains thereafter.

In order to obtain the income tax rate t_s for corporations, we need to make an assumption on how profits in these (parent) firms are distributed. If all profits are distributed as dividends by the corporate shareholder, the tax rate on distributed earnings applies. In contrast, if all profits are retained, the corporation tax on retained earnings, t_r, is applicable (see Table 1 for details). We assume that the average firm has a dividend payout ratio of 70 per cent (with published earnings as reference), roughly equal to the percentage of published earnings that German firms pay out as gross dividends (see Andres et al. 2009). Based on this assumption, the effective (weighted average) corporate tax rate for a firm is 42 per cent during the period up to

1989 [36%(70%)+56%(30%)]. Plugging these values into equation (1), we obtain a tax discrimination variable for corporations that is always larger than 1 for the period 1984-2000. Thus, corporations have a strong tax preference for dividends during that period. From 2001 onwards, corporations are indifferent between capital gains and dividends. As dividends are sticky (Lintner 1956), it makes sense to argue that the high dividend payouts fuelled by corporations' initial preference for dividends will not be reduced once corporations become indifferent between dividends and capital gains.

H7: Firms controlled by corporations have higher dividend payouts than firms controlled by individuals.

(iii) *Foreign investors*. As this type of investor is not entitled to a tax credit by the German fiscal authorities, it may be subject to double taxation which includes corporate tax on the earnings of the German firm and withholding tax on dividends as well as income tax in the investor's home country.[3] Hence, the tax discrimination variable for foreign investors is:

$$TAX = \frac{\left(\left(1-t_d\right)-t_d t_{ss}\right)\left(1-t_{sf}\right)}{\left(\left(1-t_r\right)-t_r t_{ss}\right)\left(1-t_{gf}\right)} \qquad (4)$$

where t_{gf} (t_{sf}) stands for the tax rate on capital gains (income) in the foreign investor's home country and t_d stands for the corporate tax on distributed earnings. Thus, the preference depends on the tax treatment by the investor's home country and the existence of double taxation treaties. As it is not feasible to determine the tax status of each foreign investor in our sample firms, we ignore firm-year observations relating to control by foreign investors in our regression analysis.

(iv) *Widely held firms.* As we do not have information on the *individual* shareholders of these firms, we use a *weighted average tax discrimination variable*. The aggregate weights are based on German surveys on share ownership ('*Gesamtwirtschaftliche Finanzierungsrechnung Deutsche Bundesbank'*) and relate to the importance of various types of shareholder in the average listed German firm. For example in 1990,

[3] The withholding tax of 25 per cent may be reduced by German double taxation treaties with other countries.

17 per cent of all the shares listed on the German stock exchanges were owned by individuals, 69 per cent by companies, and 14 per cent by foreign investors. We assume that the tax discrimination variable for foreign investors is 1 and the tax discrimination variables for corporations, local and federal government authorities, banks, and insurers is 2.0. Given that the tax discrimination variable for individuals is 0.94 in 1990 (all computations are based on equation (1)), the weighted average tax discrimination variable for widely held firms amounts to 1.68 (17%*0.94+69%*2.0+14%*1).

3. Sample and Definitions

3.1 Sample

This study is based on a sample of 220 industrial and commercial firms over the twenty-two-year period from 1984 to 2005. All firms are quoted on at least one of the eight German stock exchanges. Thirty-six firms obtain a listing after the year 1984, but all sample firms are quoted in 1989.[4] Overall, the sample consists of an unbalanced panel of data, i.e. 3,932 firm-year observations (see Table 2).

[INSERT TABLE 2 ABOUT HERE]

Data are collected from *Saling/Hoppenstedt Aktienführer*,[5] an annual publication which provides detailed company information, including balance sheet and profit and loss account items, historical data on equity raised, shareholdings, share prices, and the date of first quotation. The following data items are gathered from this source: earnings after tax, depreciation, changes in pension provisions and other provisions, dividends per share for both preference and ordinary shares, the number of ordinary and preference shares outstanding, as well as information on ownership of voting equity. The dividend-per-share figures are adjusted for stock splits.

[4] Thirty-six firms leave the stock market and go private, sixteen go bankrupt, thirty-eight are taken over and twelve put in place a 'control agreement' during the period of analysis.

[5] The name *Saling Aktienführer* changed to *Hoppenstedt Aktienführer* in 1997 with the publication of the 90th edition of the guide.

3.2 Definitions and data issues

We use gross dividends, defined as cash dividends gross of corporation tax levied on dividend distributions, in our analysis. About 25 per cent of our sample (58 cases out of a total of 220) have preferred stock listed in at least one year during the period of 1984-2005. Preference shares in Germany do not grant any voting rights, but offer a guaranteed dividend (normally a fixed percentage of the face value of the share). If the firm has sufficient earnings after tax, the holders of the preference shares will receive their guaranteed dividend. If after the payment of the guaranteed dividend, the firm still has earnings left, the holders of the ordinary shares will receive a (variable) dividend. Earnings permitting, the holders of the preference shares will then receive the equivalent amount paid to the ordinary shareholders, on top of the guaranteed dividend. If the guaranteed dividend has been carried over twice, then the preference shares receive a temporary voting right until the firm has paid the dividends outstanding. To account for the dividends on preferred stock, we calculate a weighted average of the dividend paid on ordinary and preference shares. The weights consist of the amount of share capital issued in the form of preference shares and ordinary shares, respectively, expressed as a proportion of the total market value of the total equity capital outstanding.[6]

In contrast to our approach, UK and US studies typically ignore dividends other than those paid on ordinary shares (see e.g., Bond *et al.* 1996, Edwards *et al.* 1986). However contrary to UK firms which always have their ordinary shares listed, some German firms only have their preference shares listed with all of the ordinary shares being held by the main shareholder, typically a family. Still, even for Germany, one may argue in favour of the exclusion of dividends on preferred equity, especially in the context of our panel of data, given that the dividends per share for the two classes of shares are perfectly correlated for virtually all of our sample firms. Indeed, for only 13 German firms (out of the 58 with preference shares) the change in the dividend per

[6] Hence, the weighted average dividend per share is calculated as follows. Let N_T be the total number of shares outstanding, N_o the number of ordinary shares, and N_p the number of preference shares. Thus, $N_T = N_o+N_p$. Moreover, let DPS_o be the dividend per share paid on ordinary shares, and DPS_p the dividend per share paid on preference shares. The weighted average dividend per share (WDPS) is then equal to $WDPS = (DPS_0 x N_0 + DPS_p x N_p)/N_T$.

ordinary share is different from that in the dividend per preference share. Furthermore, differences are only observed in the case of dividend omissions and dividend initiations, reflecting the fact that preference shares give rise to a guaranteed dividend. While our data suggest that changes in the dividends earned on both types of shares are highly correlated, we still opt for the inclusion of dividends on preference shares. However, our results are qualitatively similar if dividends on preference shares are excluded.

Another peculiarity of the German system is the high incidence of 'specially designated dividends'. We observe such special dividends for 343 of the 3,932 firm-year observations, i.e. 9 per cent of the whole sample. These special dividends predominantly reflect one-off payouts of excess cash to the shareholders. Brickley (1983), who studies special dividends paid by US corporations, also finds that these are motivated by the desire to return cash to the shareholders. For 44 firm-years, we observe large one-off payments associated with 'special anniversaries', sales of subsidiaries, or distributions of reserves previously accumulated at a different rate of taxation. The fundamental problem with these 343 large payments is one of timing as it is not clear which accounting year(s) these payments should be allocated to. As we do not have enough information allowing us to allocate these payments to specific accounting years, we decide to exclude these payments.

Finally, some quoted German companies have so called 'control agreements' with their parent company. There are two such types of agreements: a Profit and Loss Agreement (PLA) and a Subordination of Management Agreement (SMA).[7] An SMA requires the controlling company to absorb any losses, but the transfer of profits is optional. A PLA implies a transfer of both profits and losses to the controlling company. Hence, the question arises as to whether companies with such agreements should be included in this study. We decide to exclude these firms from our analysis for two reasons. First, the main benefit from these control contracts for the parent is to carry forward possible tax losses generated by the subsidiary. The parent can then absorb these losses and offset them against its profits in order to reduce its tax bill.

[7] Both agreements require the approval of at least 75 per cent of the voting capital represented at the general meetings of both the controlling company and the subsidiary. Note that the existence of a controlling shareholder does not necessarily imply the existence of either PLA or SMA.

Indeed, in Germany as well as the UK, but not the USA, the corporate tax liability is based on the earnings of the individual companies in the group. Hence, the amount transferred to the parent company is not a dividend as such, but rather the result from the effort to reduce the tax liability of the parent company. Second, the financial statements for firms with such agreements often do not provide any information on their profit and, instead, disclose the amount (which may be positive or negative) that is transferred to the parent company as well as the dividend per share paid to the minority shareholders of the controlled company. One way of dealing with this data issue is to use consolidated accounts. If the parent firm is publicly quoted, the transfers from the quoted subsidiary to its parent company will be reflected in the parent firm's financial statements, and therefore these subsidiaries will be included, albeit indirectly, in our sample. This is one reason why consolidated accounts are used in this study.

The other reason why we use consolidated accounts is that in practice the dividend policy of the parent company is determined by considering the annual consolidated accounts. However, a problem arises from working with consolidated accounts as we have 14 sample firms that are owned by other corporations which in turn are also in our sample. Hence, there is some degree of double-counting in our data sample which may bias our estimations. However, the size of these 14 firms is usually very small compared to their parent companies and the bias created by the double counting is therefore unlikely to be severe. A typical example is Renk AG, which is owned by MAN AG during our sample period. The average market capitalization of Renk AG is 8 per cent of the market capitalization of the average sample firm, and only 3 per cent of the market capitalization of MAN AG (which is 3 times as large as the average listed firm).

To measure earnings, we use cash flow – defined as zero distribution profits gross of depreciation and changes in provisions – divided by the number of shares outstanding (including both ordinary and preference shares) at the end of the accounting year.[8] Our use of cash flow rather than published earnings is in line with Andres et al. (2009)

[8] Behm and Zimmermann (1993) use 'net profits', a figure that is suggested by the German Financial Analysts Association (DFA). However, data on net profits are not available for all firms in our sample and, in any case, the figure is only reported if it is not negative.

who find that dividends of German firms move in line with the former, but not the latter. Indeed, published earnings are subject to smoothing.

We gather information on all the disclosed holdings of voting shares over the period of 1984 to 2005 from *Saling/Hoppenstedt Aktienführer*. Large shareholders controlling at least 25 per cent of the voting rights are classified into the following eight categories: families or individuals, banks, industrial or commercial corporations, insurance companies, local and federal government authorities, foreign investors, industrial or financial holding companies, and foundations (*Stiftungen*). As previously mentioned, an important feature of the German system of corporate governance is the complexity of control structures.[9] Quoted firms can be controlled by other corporations and these, in turn, can be controlled by e.g. families or individuals, banks, local or federal government authorities, or be widely held companies.

According to Franks and Mayer (2001), one of the main features of the German capital market is the extensive use of complex shareholding structures such as pyramids of ownership (see Figure 1).

[INSERT FIGURE 1 ABOUT HERE]

To account for the complexity of control structures in Germany, we collect data on *first-tier* control as well as *ultimate* control. In Figure 1, at the first tier the controlling shareholder of stock-exchange listed corporation A is corporation B. In turn, corporation B is controlled by corporation C. As corporation C does not have a controlling shareholder, control over corporation A ultimately resides with corporation C. To complete the shareholder data from *Saling/Hoppenstedt Aktienführer*, we also use *Commerzbank - Wer gehört zu Wem*, a guide that is published every three years and which contains data on the shareholder structure of roughly 11,000 of the larger German firms, i.e. those with equity capital of at least € 0.51 million (DM 1 million). This guide is particularly useful in cases where companies at intermediate layers are privately held, and are therefore not covered by *Saling/Hoppenstedt Aktienführer*. If there is no shareholder holding at least 25 per

[9] See e.g. Boehmer (2002), Becht and Boehmer (2001) and Franks and Mayer (2001). Franks et al. (2009) report such complex control structures not only in Germany, but also France and Italy.

cent of the voting shares of A, then A is said to be widely held. Conversely, the ultimate controlling shareholder of a firm in our sample is said to be at the first tier if the first-tier shareholder is a bank or insurance company, local or federal government authorities, a foreign investor or a family. In all other cases, the ultimate shareholder is located at a higher tier which is reached when one of these two criteria is satisfied or when we find a corporation which is widely held. If we reach such a widely held firm at a specific layer, we state that ultimate control lies with this corporation (and at this layer). Figure 1 illustrates this point: we consider corporation C to be the ultimate shareholder of corporation A. We can then claim that company C controls firm A through a pyramid.

It is important to note that this procedure differs markedly from that of Faccio et al. (2001) and Faccio and Lang (2002) in that we trace the ultimate controlling shareholder of a firm even if one of the firms in the control chain is unlisted. Conversely, both Faccio et al. (2001) and Faccio and Lang (2002) assume that all unlisted firms in the control chain are family controlled, which may lead to misclassifications. We thus agree with Franks et al. (2009, p.5) 'that an analysis of ultimate ownership of listed firms must take into account the true ownership structures of private firms that are involved in controlling these listed firms'.

3.3 Measures of control

We measure both first-tier control and ultimate control. We also use two different types of measures of control. The first type consists of three measures of the concentration of control. First, we consider the proportion of voting shares owned by the largest shareholder at the first or ultimate level of firm *i* at time *t-1* ($L_{1i,t-1}$). A shareholder is considered to be the largest shareholder if he has the highest percentage of voting rights and owns at least 25 per cent of the votes. This shareholder may or may not be on the management board (*Vorstand*) or supervisory board (*Aufsichtsrat*) of the firm. In the overwhelming majority of listed German firms, the large shareholder sits on at least one of the two boards. By law, at least fifty per cent of the supervisory board seats, including that of the chairman, are reserved for the shareholder representatives. Goergen (1998) analyses the management and supervisory board representation of 51 firms whose main shareholder at the time of

going public is a family. He finds that members of the controlling family hold on average 17 per cent of the shareholder seats on the supervisory board and almost half of the seats on the management board. Further, in 27.5 per cent of the companies, members of the family sit on both boards and in 88 per cent of the companies the family chairs at least one of the two boards. Gerum, Steinmann and Fees (1988) and Franks and Mayer (2001) find similar patterns. Second, we use the Herfindahl index ($H_{i,t-1}$) based on all the disclosed stakes of voting shares at the first or ultimate level of firm *i* at time *t-1* as a measure of the concentration of control.[10] However, there is a data issue relating to the calculation of this index for the years preceding 1995. Indeed, shareholders did not have to disclose shareholdings below 25 per cent until 1995 when the disclosure threshold was reduced to 5 per cent ("*Zweites Finanzförderungsgesetz*"). Therefore, the Herfindahl index may be a noisy measure of the concentration of control before 1995. However, although the disclosure threshold before 1995 was 25 per cent, there was voluntary disclosure of some of the stakes which fell below that threshold. Bearing in mind that our aim is to measure control, it is highly unlikely for a shareholder to exercise any degree of control over his firm while managing to remain unknown to the firm and the general public. However, as a robustness check we also recalculate our Herfindahl index across the entire period of study by ignoring any stakes below 25 per cent. We find that our results are not affected by the exclusion of these stakes. Third, we use two dummy variables, $WH1_{i,t-1}$ and $WH2_{i,t-1}$, that equal one if there is no large shareholder of firm *i* at time *t-1* holding at least 25 or 50 per cent of the votes, respectively, at the first or ultimate level.

The second type of measure of control takes into account the type of large shareholder (i.e. banks, families and other corporations).[11] $B_{i,t-1}$ takes the value of the proportion of votes held by the bank, if a bank is the largest shareholder of firm *i* at time *t-1* with at least 25 per cent of the voting shares, and is zero otherwise. $F_{i,t-1}$ and $IC_{i,t-1}$ are the

[10] The index is defined as $H = \sum_j s_{ij}^2$ where s_{ij} is the stake of voting shares held by shareholder *j* in firm *i*.

[11] As mentioned above, we exclude firms that are controlled by foreign investors from the regression analysis since it is not possible to determine the tax status for each foreign investor in our sample firms.

equivalent variables measuring the percentage of votes held by families and corporations, respectively.[12]

4. Descriptive data analysis

4.1 Control

Table 3 reports first-tier control as well as ultimate control for the sample firms for every fourth year over the period of 1984 to 2004. Both first-tier and ultimate control are measured in two alternative ways: first as stakes exceeding 25 per cent of the votes and, second, as majority stakes.

There are at least three important lessons to be learnt from Table 3. First, there is a noticeable difference between the most important types of shareholder when first-tier control is considered and when ultimate control is considered. For example, the first three panels, Panels A, B and C, which report control for 1984, 1988 and 1992, respectively, suggest that at the first tier families, industrial and commercial firms and holding firms are the three most important types of shareholder, each holding a blocking minority in roughly a fifth of the sample firms. When first-tier control is defined as majority control, holding companies lose somewhat in importance, but they are still among the three most important types of shareholder during 1984-1992. However when the focus is on ultimate rather than first-tier control, families are by far the most important type of shareholder and the other two types are dwarfed in comparison. The increase in the importance of families as controlling shareholders when control is measured at the ultimate tier suggests that families frequently hold control indirectly – via intermediate holding companies or other industrial and commercial companies – rather than directly. However, it would be over-simplistic to assume that all unlisted holding companies and other industrial and commercial companies are ultimately family controlled. Indeed, as e.g. Panel A suggests some of the other types of shareholder also exercise control indirectly. One such type of shareholder is banks. If control is measured at the ultimate level control by banks increases by a factor of 1.2 (for 2000) and 2 (for 2004).

[12] The results do not change substantially when we use the proportion of the voting shares held by each type of shareholder when they are the largest shareholders, irrespective of whether they hold more than 25% of the voting rights or not.

Second, while the importance of families as controlling shareholders remains constant over the entire period of 1984 to 2004, the importance of other types of controlling shareholder changes significantly. Types that lose in importance are local and federal government authorities as well as banks which have been traditionally associated with the German system of corporate governance. When control is measured at the ultimate level local and federal government authorities and banks have control over 12% and 16% of the sample, respectively, in 1984. However, these percentages are reduced to less than one per cent and less than 2 per cent in 2004. Dittmann et al. (2010) find a similar decrease in bank control over time. The main cause for this decline is a change in capital gains taxation in 2002 which reduced the tax liability caused by the sale of stakes in other companies. In addition, the German government started a privatization programme in the 1990s, reducing its stakes in public companies (in particular in utility companies such as RWE, VEBA, and BEWAG). Conversely, foreign investors have rapidly increased in importance as controlling shareholders, holding a majority of the votes (a blocking minority) in about 7 per cent (9 per cent) of the sample at the start of the period and 17 per cent (21 per cent) at the end of the period.

Third, there is also evidence that the percentage of widely held firms increased over the period. However, given the selection criterion for our sample firms (firms had to be listed in 1989) this increase may be entirely due to the increase in the size of the firms during the period of study. Hence, it is difficult to draw any generally valid conclusions from this pattern.

[INSERT TABLE 3 ABOUT HERE]

4.2 Dividends and control

Tables 4 and 5 show the average cash flow per share, dividend per share and dividend payout ratio for firms with stable control over the period of study and for those with a control change, respectively.[13] Table 4 defines firms with stable control as those that do not experience a change in their ultimate shareholder holding at least 25% of the

[13] Tables 4 and 5 focus on a smaller range of types of large shareholder than Table 3 given that there are too few observations for the omitted types of large shareholder.

votes during 1984-2005. The table is based on the 133 firms out of the 220 that satisfy this criterion. Firms that stay widely held during the entire period have both the highest average cash flow per share and dividend per share. However, their dividend payout ratio is the second lowest, after that of bank-controlled firms. Firms controlled by families and other companies have the highest payout ratios. Table 4 suggests two important points. First, given that widely held firms have the second lowest payout ratio dividends do not seem to be a substitute for large-shareholder monitoring. Second, the type of large shareholder matters as dividend payout ratios differ substantially across the various types of shareholder. All in all, Table 4 fails to provide support for hypothesis *H1*.

[INSERT TABLE 4 ABOUT HERE]

Table 5 focuses on the 56 firms that experience a change of control during 1986-2003. The period of 1986-2003 is chosen in order to have at least two years of data before and after the year of the control change. Twenty-two firms experience more than one change in control, resulting in a total of 78 observations.[14] The table reports the average dividend per share and cash flow per share as well as the payout ratio for firms changing from widely held to closely held and those that experience the exact opposite change in control. Thirty-seven firms experience the former change in control whereas 41 firms experience the latter. There is no evidence suggesting that dividend policy changes substantially over the five years around the change in control for both types of control changes. However, when the type of the new (or past) controlling shareholder is taken into consideration there is some evidence that firms that are originally widely held and then become controlled by a family increase their dividend and cash flow per share as well as their dividend payout ratio. Conversely, firms that experience the exact opposite change in control decrease their dividend payout ratio. Further, firms that are initially widely held and then become controlled by a bank reduce their dividend payout ratio whereas those that experience the exact opposite change in control increase their dividend payout ratio. Hence similar to Table

[14] For those firms that have more than two changes in control, none of the changes in control after the second one renders the minimum of two years of data after the change. Hence, these changes have been excluded from Table 5.

4, Table 5 does not provide support for hypothesis *H1* and suggests that the type of controlling shareholder is important when considering the dividend payout.

[INSERT TABLE 5 ABOUT HERE]

5. Methodology

5.1 Dividend model

In our empirical analysis, we extend the seminal dividend model by Lintner (1956). Based on interviews with chief financial officers (CFOs) of 28 large US companies, Lintner provides some of the earliest, path breaking evidence on the determinants of dividend payouts. Although he discovers considerable differences in dividend policy across companies, he also finds the following four common patterns. First, CFOs have in mind a long-term target payout ratio when setting their firm's dividend. Second, they tend to focus on dividend changes rather than dividend levels. Third, a change in dividends is usually caused by a major, unexpected and persistent change in earnings. Finally, dividends are sticky, i.e. they only change if the CFO perceives that there is a long-term change in earnings warranting this change.

Based on the above patterns, Lintner (1956) develops his model of corporate dividend behaviour, the so called *partial adjustment model*. For any year *t*, the target level of dividends, D^*_{it} for firm *i*, is a proportion of current earnings, E_{it}, in line with the long-term payout ratio r_i:

$$D^*_{it} = r_i E_{it} \tag{5}$$

In any given year the firm will only *partially* adjust towards the target dividend level. Hence, we have:

$$D_{it} - D_{i,t-1} = a_i + c_i (D^*_{it} - D_{i,t-1}) + u_{it} \tag{6}$$

where a_i is a constant; c_i is the speed at which dividends adjust to changes in earnings, with $0 \le c_i \le 1$; and $D_{it} - D_{i,t-1} = \Delta D_{it}$ is the actual change in the dividend compared to the desired change which is $D^*_{it} - D_{i,t-1}$.

If $a_i = 0$ and $c_i = 1$, then actual dividends adjust immediately and fully to any change in earnings and the actual dividend will always coincide with the firm's target dividend. At the other extreme, if $c_i = 0$, then dividends follow a random walk. The pattern uncovered by Lintner that firms gradually adjust dividends in response to changes in earnings and thus apply dividend smoothing implies that the speed-of-adjustment coefficient c_i is within the]0; 1[range. Furthermore, a positive a_i represents the management's resistance towards dividend cuts. Substituting equation (6) into (5) then yields the following equation:

$$D_{it} = a_i + b_i E_{it} + (1 - c_i) D_{i,t-1} + u_{it} \tag{7}$$

where $r_i = b_i / c_i$ is the payout ratio and c_i the speed-of-adjustment coefficient.

Fama and Babiak (1968) extend the partial adjustment model by including a lagged earnings variable. They assume that the process generating the annual earnings of firm *i* is as follows

$$E_{it} = (1 + \lambda_i) E_{i,t-1} + v_{it} \tag{8}$$

where v_{it} is a serially uncorrelated error term. A further assumption is that there is full adjustment of dividends to the expected earnings change $\lambda_i E_{i,t-1}$, and partial adjustment to the remainder:

$$D_{it} - D_{i,t-1} = a_i + c_i \left[r_i (E_{it} - \lambda_i E_{i,t-1}) - D_{i,t-1} \right] + r_i \lambda_i E_{i,t-1} + u_{it} \tag{9}$$

which rearranged gives the following equation

$$D_{it} = a_i + (1 - c_i) D_{i,t-1} + b_i E_{it} + d_i E_{i,t-1} + u_{it} \tag{10}$$

where $b_i = c_i r_i$, and $d_i = r_i \lambda_i (1 - c_i)$.

As pointed out above, several research papers have documented that dividend payments are not only determined by past dividends, earnings and cash flows, but also by other factors. In particular, a firm's major shareholder may have an influence on the dividend payout. More precisely, as discussed above, the large shareholder's appetite for dividends will depend on his tax status. Hence, equation (10) needs to be augmented by a variable measuring the firm's control structure. Furthermore, Andres et al. (2009) provide empirical evidence that German firms base their long-term

payout ratio on cash flows rather than published earnings. Hence, our basic, empirically testable, model is as follows:

$$\frac{D_{it}}{MVE_{it}} = \alpha\left(\frac{D_{i,t-1}}{MVE_{it-1}}\right) + \beta\left(\frac{\Pi_{it}}{MVE_{it}}\right) + \delta\left(\frac{\Pi_{i,t-1}}{MVE_{it-1}}\right) + \rho C_{i,t-1} + YEAR_t + \eta_i + V_{it} \quad (11)$$

where D_{it} stands for the total dividend payment for firm *i* at time *t*, Π represents total cash flow, $C_{i,t-1}$ is a measure of control at time *t-1*, MVE_{it} is the market capitalization of firm *i* at the beginning of each year, *YEAR* stands for a vector of time dummies, η_i is the firm-specific effects and V_{it} is the disturbance term.

As stated in Section 3.3, we use two different types of measures of control. The first type consists of three measures of the concentration of control. First, $L1_{i,t-1}$ is the proportion of votes held by the ultimate, controlling shareholder of firm *i* at time *t-1* (again, the threshold of 25% applies). Second, $H_{i,t-1}$ is the Herfindahl index for all disclosed shareholdings of firm *i* at time *t-1*. Third, $WH1_{i,t-1}$ and $WH2_{i,t-1}$ are two dummy variables, which are set to one if there is no shareholder holding at least 25% and 50% of the votes of firm *i* at time *t-1*., respectively. Finally, we also use a second type of measure which accounts for the type of large shareholder. In detail, $B_{i,t-1}$ takes the value of the proportion of votes held by the bank, if a bank is the largest shareholder of firm *i* at time *t-1* with at least 25 per cent of the voting shares, and is zero otherwise. $F_{i,t-1}$ and $IC_{i,t-1}$ are the equivalent variables measuring the proportion of votes held by families and corporations, respectively.

5.2 Estimation technique

In the regression analysis we use ordinary least squares in levels (OLS) as well as the generalised method of moments as a system of equations in levels (with lagged differences of the dependent and the independent variables as instruments) and equations in first differences (with lagged levels of the dependent and independent variables as instruments) (GMM-in-system). If dynamic panel data models such as equation (11) are estimated over a large cross-section of firms and a comparatively small number of time periods, there is a potential estimation problem caused by the correlation of the explanatory variables with the firm-specific effects, η_i. Thus, if we

estimate equation (11) using OLS, the estimators are likely to be inconsistent and biased. Since the Within-Groups estimator, i.e. the estimator obtained from applying OLS on the equation with each observation expressed as the deviation from the time mean, will still be inconsistent and biased, we use an instrumental variable approach as suggested by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate equation (11). This approach consists of estimating a system of first-differenced and levels equations that offers significant efficiency gains in situations where a simple GMM estimator in first differences performs poorly. The resulting linear estimator uses the lagged differences in the dependent and independent variables as instruments for the equations in levels, in addition to the lagged levels of the dependent and independent variables as instruments for the equations in first differences. Specifically, it uses lagged differences of the dependent and explanatory variables, (e.g. $D_{i,t-1} - D_{i,t-2}$) as additional instruments in the levels equations, under the assumption that these differences are uncorrelated with the firm-specific effects, η_i, even though the levels of these are correlated with η_i. We call this technique GMM-in-system.

6. Regression analysis

Out of the sample of 220 firms, described in Section 3.1, we exclude firm-year observations relating to control by foreign companies, by local and federal government authorities and by foundations. While the former type of large shareholder is excluded due to the difficulty of determining the tax status of individual foreign shareholders, the latter two types are excluded due to the small number of observations. This leaves us with a total of 3,264 firm-year observations covering 214 firms that are controlled by a family, bank or another corporation or are widely held.

6.1 Concentration of control

Table 6 shows the results from the estimation of the regression model based on equation (11). The table reports the results for both the OLS in levels and the GMM-in-system estimation. There is no evidence, neither from the OLS regression (specification (1)) nor from the GMM-in-system regression (specification (2)), that large shareholders have any impact on dividend policy. There is also no evidence that

the degree of control concentration, as measured by the Herfindahl index, has any impact on the dividend payout ratio (specifications (3) and (4)). Finally, there is also no evidence that the lack of a controlling shareholder has any impact on dividend policy (specifications (5), (6), (7) and (8)). This implies that there is no empirical support for hypothesis *H1*. There is also no relationship between control and dividend policy when we allow for this relationship to take on a non-linear form (specifications (9) and (10)). We therefore cannot confirm our hypothesis *H2*.

It should be noted that the lack of results is hardly surprising given the patterns suggested by the univariate statistics presented above. While some types of large shareholder (in particular banks) are associated with comparatively low levels of dividend payouts, others (most notably families) seem to follow a policy of high payouts. The variables used so far do not distinguish between the different types of controlling shareholders and are therefore not able to capture these very different payout policies.

[INSERT TABLE 6 ABOUT HERE]

6.2 Type of controlling shareholder

Table 7 is similar to Table 6 as it is also based on equation (11). However, control is now measured by taking into account the type of the ultimate controlling shareholder in addition to the concentration of control. In detail, we account for three different types of controlling shareholder. The first type we account for is families: *F* takes the value of the proportion of votes held by the family, when a family is the largest shareholder of firm *i* at time *t* holding at least 25 per cent of the voting shares (at the ultimate level), and is zero otherwise. The second one is the equivalent measure for banks and the third one is the equivalent measure for other industrial or commercial firms.

While Table 6 does not suggest a relationship between dividends and the concentration of control, Table 7 suggests that there is such a relationship when the type of ultimate controlling shareholder is taken into account. Indeed, there is strong

evidence that firms controlled by families have a higher dividend payout than firms controlled by other types of shareholder and widely held firms. This result confirms the conclusions drawn from Table 3 and provides support for hypothesis *H3*. Outside investors seem to demand higher dividend payouts as protection against expropriation by the controlling family. As an alternative interpretation, our findings are consistent with the idea that families pay themselves higher dividends because their portfolios are generally not well diversified. They therefore seem to be dependent on their primary asset as a source of income.

However, there is no evidence that firms that are controlled by other firms have a particular dividend policy. This calls for the rejection of hypothesis *H4*, which states that firms controlled by other firms pay higher dividends than firms controlled by other types of large shareholder. Finally, while the OLS regressions suggest that banks pay lower dividends, the GMM-in-system regressions do not confirm that there is such a relationship. We thus find only weak support for hypothesis *H5*. Still, this result lends some support to Edwards and Fischer (1994) who argue that German banks are not very active in monitoring the management of their investee firms.

[INSERT TABLE 7 ABOUT HERE]

6.3 Tax status of controlling shareholder

Table 8 focuses on the controlling shareholder's tax preference for dividends. The first specification includes the dividend tax discrimination variable, but does not adjust for the presence of and the level of control held by a particular type of shareholder (i.e. families, banks or industrial and commercial corporations).[15] The dividend tax discrimination variable is negative and significant. This implies that the higher the tax advantage of dividends, the lower is the dividend paid out by the firm. This seemingly contradictory finding may be a direct result of the effects of different types of shareholder on the dividend payout reported above: control by banks is associated with lower dividends (although bank control is only partly significant) even

[15] As specified in Section 4.3., we use the aggregate weighted average tax rate for firms that are widely held.

though banks (and corporations more generally) have a strong tax preference for dividends prior to 2001. In contrast, family control is associated with significantly higher dividend payments even though one would expect the exact opposite pattern given the tax status for families. In other words, specification (1) erroneously assumes that the tax variable is the only determinant of dividends. If we add the percentage of votes held by the type of controlling shareholder at the first tier (specification (2)), the tax discrimination variable is no longer statistically significant. Similarly, when control is measured at the ultimate tier, we find that the tax discrimination variable is now positive and not statistically significant (specification (3)). The results further confirm that control at the ultimate level should be considered when analysing the impact of controlling shareholders on firms' payout policy. When family control is measured at the ultimate level, the coefficient is again statistically significant, but falls short of being significant if control is measured at the first tier.

[INSERT TABLE 8 ABOUT HERE]

In sum, the evidence provided in our analysis does not support the argument that the tax status of the controlling shareholder influences dividend policy in Germany. In other words, controlling shareholders do not seem to impose their tax preferences on minority shareholders. In addition, we find that controlling families, despite a strong tax disadvantage of dividends, are associated with significantly higher dividend payouts. Hence, hypotheses H6 and H7 are not supported. Given the danger of minority shareholder expropriation by controlling shareholders (e.g. Connelly et al. 2010), families seem to use dividends as a device to signal to outside shareholders that they are willing to forego their private benefits of control. Higher dividend payouts are also beneficial to minority shareholders from a tax perspective as individuals whose marginal income tax rate is lower than the corporate tax rate on retained earnings (which is equal to the highest income tax rate for large parts of the sample period) prefer dividends over capital gains (see section 4.3). In conclusion, our findings suggest that dividend payouts of German firms are not influenced by tax but by control and/or governance considerations.

7. Conclusion

This paper has studied the dividend behaviour of 220 industrial and commercial German firms over 1984-2005. Theory predicts a link between the concentration of control and dividend policy. Indeed, Easterbrook (1984) and Rozeff (1982) predict that dividends play an important role in firms with no large shareholder and no or little managerial ownership. This suggests a linear and decreasing effect of the concentration of control on the dividend payout. In contrast, Schooley and Barney (1994) suggest that there is a convex relationship between the concentration of control and the dividend payout. At low levels of ownership and control dividends are important in terms of realigning the interests of the managers with those of the shareholders. The role of dividends decreases at intermediate levels of ownership and control. It then becomes again important as ownership and control become highly concentrated and there is a clear danger of the large shareholder expropriating the minority shareholders. However, we fail to find evidence in favour of both a linear link and a non-linear link.

In contrast, when we account for the type of controlling shareholder, we find a link between control and the dividend payout. Indeed, firms controlled by families have significantly higher dividend payouts and firms controlled by banks have significantly lower dividend payouts than all other firms.

However, we do not find that the tax status of the controlling shareholder has any impact on the dividend decision. While families and individuals had a clear preference for capital gains over dividends for the entire period, family-controlled firms paid significantly higher dividends that all other firms.

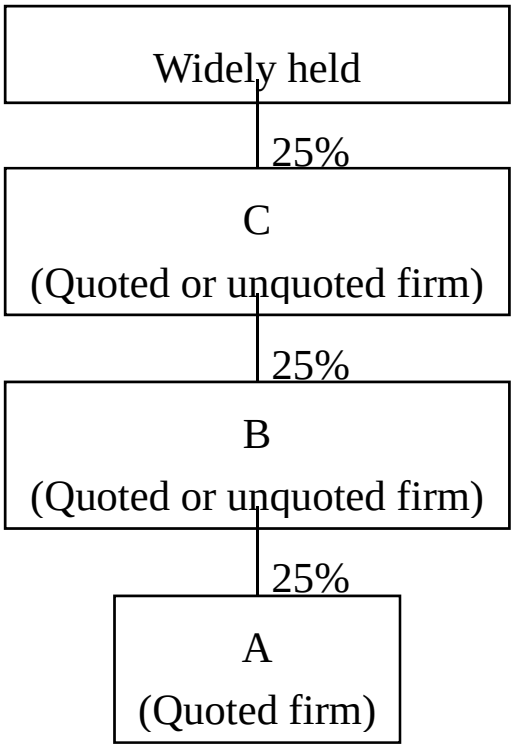

Figure 1: Example of a 'pyramid' structure. Firm A is one of the firms in our sample. At the *first-tier* of the pyramid, it is controlled by firm B (which holds 25 per cent of its voting shares), which can be a quoted or unquoted firm. At the next layer, we find that firm B is controlled by firm C (which holds 25 per cent of its voting shares), which again can be quoted or unquoted, but is in this case widely held. *Ultimately*, firm C controls firm A.

Table 1
Corporation Tax Rates on Retentions and Dividends, Tax Rates on Personal Income and Solidarity Surcharge in Germany

	Retentions [1]	***Distributions***	***Top Income Tax Rates***[2]	***Solidarity Surcharge***
1977–1989	56%	36%	56%	0%
1990	50%	36%	53%	0%
1991-1992	50%	36%	53%	3.75%
1993-1994	45%	36%	53%	0%
1995-1997	45%	30%	53%	7.5%
1998	45%	30%	53%	5.5%
1999	40%	30%	53%	5.5%
2000	40%	30%	51%	5.5%
2001-2003[3]	25%	25%	48.5%	5.5%
2004	25%	25%	45%	5.5%
2005	25%	25%	42%	5.5%

[1] Because of tax exemptions and reductions, the tax charge for part of the profit may vary from 0 to 50 per cent between 1990 and 2000. It is therefore necessary to differentiate retained profits and reserves according to the rate of tax that they incur, because when they are distributed they must bear a uniform tax rate of 36 per cent (prior to 1995) or 30 per cent (between 1995 and 2000). When the firm distributes profits which have already been taxed at the tax rate applying to retained profits, it can claim a reduction in its current tax bill or even a tax refund. For example, until December 1993, by distributing profits that had been retained before 1990, firms could receive a tax refund of 6 per cent. As a consequence, a few companies that had accumulated comfortable levels of reserves before 1990 have paid extra dividends during this period.
[2] Until 1990, personal income of more than DM 130,000 was subject to the highest tax rate. From 1991 until 1999, personal income exceeding DM 120,000 was taxed at the highest tax rate. Between 1999 and 2004, the threshold was gradually lowered to DM 102,000.
[3] In 2001, Germany underwent a major tax reform. Under the new taxation laws, distributed and retained earnings are no longer taxed at different rates.

Table 2 ***Overall Sample Composition***	
Panel A	
Sample Period	1984-2005
Number of Firms	220
Number of Firm-Year Observations	3932
Panel B	
Number of Firms	***Number of Records per Firm***
74	22
14	21
15	20
12	19
16	18
22	17
12	16
14	15
5	14
3	13
1	12
12	11
7	10
1	9
7	8
1	7
3	6
1	5

Table 3

First-Tier and Ultimate Control of 220 German Industrial and Commercial Quoted Firms in 1984, 1988, 1992, 1996, 2000 and 2004

Widely held firms are firms without a shareholder controlling at least 25 (50) per cent of the voting shares. Data for closely held firms are reported according to the type of their largest shareholder. The sample size varies over the 20-year period as some firms in our sample are not quoted during the earlier part of the period of study and others delist later on as they go private or bankrupt.

	First-Tier Control				**Ultimate Level Control**			
	≥25%		**≥50%**		**≥25%**		**≥50%**	
	%	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**
Panel A: 1984								
A. Widely held	18.1	32	54.2	96	18.1	32	54.2	96
B. Closely held, the largest shareholder being:								
1. Family	21.5	38	14.1	25	32.8	58	18.1	32
2. Indust./commerc. firm	22.0	39	16.4	29	6.2	11	10.7	19
3. State	2.8	5	1.7	3	11.9	21	4.0	7
4. Bank	11.3	20	1.1	2	15.7	28	1.7	3
5. Insurer	1.1	2	0	0	2.3	4	0	0
6. Foreign investor	5.7	10	4.5	8	8.5	15	7.3	13
7. Holding company	16.9	30	7.3	13	2.8	5	2.3	4
8. Foundation	0.6	1	0.6	1	1.7	3	1.7	3
Total	100	177	100	177	100	177	100	177
Panel B: 1988								
A. Widely held	19.3	42	49.5	108	19.3	42	49.5	108
B. Closely held, the largest shareholder being:								
1. Family	22.0	48	16.6	36	34.8	76	23.8	52
2. Indust./commerc. firm	18.8	41	14.2	31	5.4	12	8.7	19
3. State	3.2	7	1.8	4	10.1	22	3.7	8
4. Bank	7.8	17	0.9	2	13.8	30	1.4	3
5. Insurer	0.0	0	0	0	1.4	3	0	0
6. Foreign investor	5.0	11	3.7	8	9.2	20	6.9	15
7. Holding company	22.5	49	11.9	26	2.8	6	3.2	7
8. Foundation	1.4	3	1.4	3	3.2	7	2.8	6
Total	100	218	100	218	100	218	100	218
Panel C: 1992								
A. Widely held	17.3	37	43.9	94	17.3	37	43.9	94
B. Closely held, the largest shareholder being:								
1. Family	19.7	42	14.5	31	35.5	76	23.4	50
2. Indust./commerc. firm	22.4	48	16.8	36	9.4	20	10.7	23
3. State	2.4	5	1.9	4	9.8	21	3.7	8
4. Bank	7.0	15	1.9	4	10.3	22	1.9	4
5. Insurer	0.9	2	0	0	2.3	5	0	0
6. Foreign investor	5.1	11	5.6	12	10.3	22	9.8	21
7. Holding company	24.3	52	14.5	31	3.2	7	4.7	10
8. Foundation	0.9	2	0.9	2	1.9	4	1.9	4
Total	100	214	100	214	100	214	100	214

	First-Tier Control				Ultimate Level Control			
	≥25%		≥50%		≥25%		≥50%	
	%	No.	%	No.	%	No.	%	No.
Panel D: 1996								
A. Widely held	20.0	37	42.2	78	20.0	37	42.2	78
B. Closely held, the largest shareholder being:								
1. Family	13.0	24	7.6	14	31.9	59	19.5	36
2. Indust./commerc. firm	18.3	34	15.7	29	5.4	10	8.6	16
3. State	2.2	4	0.5	1	10.8	20	1.1	2
4. Bank	4.3	8	2.2	4	9.1	17	2.7	5
5. Insurer	1.1	2	0.0	0	1.7	3	0.0	0
6. Foreign investor	8.6	16	8.1	15	15.2	28	14.6	27
7. Holding company	31.4	58	23.2	43	3.2	6	9.1	17
8. Foundation	1.1	2	0.5	1	2.7	5	2.2	4
Total	100	185	100	185	100	185	100	185
Panel E: 2000								
A. Widely held	17.2	27	39.5	62	17.2	27	39.5	62
B. Closely held, the largest shareholder being:								
1. Family	12.1	19	6.4	10	34.4	54	19.1	30
2. Indust./commerc. firm	17.2	27	16.0	25	6.4	10	8.9	14
3. State	1.9	3	0.6	1	5.7	9	1.3	2
4. Bank	5.7	9	2.5	4	7.0	11	2.5	4
5. Insurer	0.6	1	0.0	0	2.5	4	0.6	1
6. Foreign investor	12.8	20	12.1	19	20.4	32	18.5	29
7. Holding company	31.9	50	22.3	35	4.5	7	7.7	12
8. Foundation	0.6	1	0.6	1	1.9	3	1.9	3
Total	100	157	100	157	100	157	100	157
Panel F: 2004								
A. Widely held	25.7	28	43.1	47	25.7	28	43.1	47
B. Closely held, the largest shareholder being:								
1. Family	14.7	16	7.4	8	34.0	37	24.8	27
2. Indust./commerc. firm	5.5	6	5.5	6	6.4	7	6.4	7
3. State	0.0	0	0.0	0	0.9	1	0.0	0
4. Bank	0.9	1	0.0	0	1.8	2	0.9	1
5. Insurer	0.9	1	0.0	0	0.9	1	0.0	0
6. Foreign investor	17.4	19	11.9	13	21.1	23	16.5	18
7. Holding company	31.2	34	28.4	31	5.5	6	4.6	5
8. Foundation	3.7	4	3.7	4	3.7	4	3.7	4
Total	100	109	100	109	100	109	100	109

Table 4

Dividend Payout Ratios of Firms With Stable Control Over the Period 1984-2005

Cash flows are defined as zero distribution profits gross of depreciation and changes in long-term provisions. Dividends are gross of tax on distributed earnings. Of the original sample of 220 German industrial and commercial firms, 133 were either *ultimately* controlled by a family, another industrial corporation, the state, a bank, or widely held (no large shareholder controlling more than 25% of the voting rights), over at least 10 consecutive years during the sample period 1984 to 2005. We report two different dividend payout ratios. The first one is the ratio of the average gross dividend across all firms over the whole period 1984-2005 over the average cash flow for all firms over the whole period 1984-2005. The second one is (shown in parentheses) the average of all (individual) firms' dividend payout ratios defined as gross dividends divided by cash flows.

Type of Control:	**Average Cash Flow Per Share (DM)**	**Average Gross Dividend Per Share (DM)**	**Dividend Payout Ratio (%)**	**No. of Firms**
Widely held firms	100.45	14.66	14.57 (17.08)	28
Family-controlled	79.73	14.41	18.07 (23.38)	63
Company-controlled firms	66.56	12.88	19.36 (21.81)	9
State-controlled firms	76.06	13.32	17.51 (21.62)	18
Bank-controlled firms	94.71	10.92	11.53 (11.91)	14

Table 5
Dividend Payout Ratios Around the Year of Control Changes

Widely held firms are firms without a large shareholder controlling at least 25 per cent the voting shares. Control is measured at the ultimate level. The table is based on the 56 firms with a change in control during 1986-2003. The period was chosen in order to have at least two years of data before and after the year of the change in control. There are 22 firms that experience two changes in control, resulting in a total of 78 control changes. Cash flows ***(CF)*** are defined as zero distribution profits gross of depreciation and changes in long-term provisions. Dividends ***(Div)*** are gross of tax on distributed earnings. Dividend payout ratios (***Div/CF*****)** are defined as the average dividend expressed as a percentage of the average cash flow across all 56 firms. The event year, *t=0*, is the year of the change in control.

Year		***Nature of Control Change*:**					
		Widely held becomes Closely held	**Closely held becomes Widely held**	**Widely held becomes Family-controlled**	**Family-controlled becomes Widely held**	**Widely held becomes Bank-controlled**	**Bank-controlled becomes Widely held**
-2	**Div**	10.5	8.7	7.9	7.2	12.6	13.5
	CF	60.8	65.5	46.4	33.8	66.2	123.5
	Div/CF	17.2	13.3	16.9	21.3	19.0	11.0
-1	**Div**	11.2	9.9	9.4	7.7	10.3	15.1
	CF	60.2	52.8	55.9	29.6	68.8	123.3
	Div/CF	18.6	18.8	16.8	26.2	14.9	12.2
0	**Div**	9.5	9.4	9.0	7.3	11.7	14.8
	CF	51.7	68.9	45.0	40.2	78.1	123.5
	Div/CF	18.4	13.6	20.1	18.0	15.0	12.0
1	**Div**	11.5	10.4	12.2	8.0	9.9	18.9
	CF	79.6	74.9	79.9	46.7	108.0	107.1
	Div/CF	14.5	13.9	15.2	17.2	9.1	17.6
2	**Div**	13.0	9.5	13.7	7.5	11.5	16.7
	CF	77.9	73.3	76.2	52.1	126.6	105.5
	Div/CF	16.7	12.9	18.0	14.4	9.1	15.8
No. of Firms		37	41	13	17	5	10

Table 6
Panel Data Estimation of the Relation Between Dividends, Cash Flows and Different Measures of Control

The sample size is 214 firms and is obtained by excluding firms from the original sample of 220 firms that are subsidiaries of foreign companies, state-controlled or controlled by foundations throughout the whole sample period. D_{it} is the dependent variable in the specifications and is total dividends scaled by the market value of equity at the beginning of the year. *CF* is total cash flows scaled by the same variable. L_i is the proportion of voting shares held by the largest shareholder at the ultimate level. *H* is the Herfindahl index of all the disclosed shareholdings. WH_1 and WH_2 are dummy variables which equal one if there is no large shareholder with at least 25 and 50 per cent the voting shares, respectively. Time dummies are included in all models. m_1 and m_2 are tests for the absence of first-order and second-order serial correlation in the residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. Sargan is a test for the validity of the instruments, asymptotically distributed as χ^2 under the null of valid instruments. Specifications (2), (4), (6), (8), and (10) are GMM-instrumental variable estimators based on a GMM-in-system procedure, which consists of a linear system of first-differenced and levels equations. The set of instruments used are levels of dividends and cash flows variables dated t-1 to t-4 in the differenced equations, and first-differences dated t-2 in the levels equations throughout all specifications. Moreover, the specifications use levels of control variables dated t-1 to t-3 for the differenced equations and levels of control variables dated t-1 in the levels equations. Standard-errors, asymptotically robust to heteroskedasticity, are reported in parentheses. ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively.

	(a)		**(b)**		**(c)**		**(d)**		**(e)**	
	OLS	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Const.	0.003	-0.000	0.004	-0.001	0.005	-0.001	0.006	-0.005	0.002	-0.004
	(0.010)	(0.012)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.010)	(0.010)	(0.012)
$D_{i,t-1}$	0.168**	0.101***	0.167**	0.100***	0.168**	0.101***	0.167**	0.098***	0.167**	0.102***
	(0.067)	(0.026)	(0.066)	(0.026)	(0.067)	(0.026)	(0.066)	(0.027)	(0.067)	(0.026)
CF_{it}	0.111***	0.118**	0.110***	0.118**	0.110***	0.118**	0.111***	0.119**	0.110***	0.119**
	(0.041)	(0.047)	(0.041)	(0.047)	(0.041)	(0.047)	(0.041)	(0.047)	(0.041)	(0.047)
$CF_{i,t-1}$	-0.034**	-0.022**	-0.034**	-0.022**	-0.034**	-0.022**	-0.033**	-0.021**	-0.034**	-0.023**
	(0.017)	(0.011)	(0.017)	(0.011)	(0.017)	(0.011)	(0.016)	(0.011)	(0.017)	(0.011)
$L_{i,t-1}$	0.003	0.002	-	-	-	-	-	-	0.015	0.041
	(0.005)	(0.011)							(0.009)	(0.029)
$L_{i,t-1}^2$	-	-	-	-	-	-	-	-	-0.012	-0.038
									(0.008)	(0.029)
$H_{i,t-1}$	-	-	0.000	0.000	-	-	-	-	-	-
			(0.000)	(0.000)						
$WH_{1i,t-1}$	-	-	-	-	-0.001	-0.004	-	-	-	-
					(0.003)	(0.007)				
$WH_{2i,t-1}$	-	-	-	-	-		-0.004	-0.001	-	-
							(0.004)	(0.001)		
m_1	0.401	-1.99	0.377	-1.99	0.429	-2.00	0.425	-1.99	0.423	-1.99
m_2	1.084	-0.59	1.061	-0.61	1.127	-0.60	1.124	-0.66	1.094	-0.59
Sargan	-	182.12	-	186.34	-	187.99	-	180.90	-	192.03
(p-values)		(0.19)		(0.13)		(0.12)		(0.20)		(0.46)
No. of Observations	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264

Table 7

Panel Data Estimation of the Relation Between Dividends, Cash Flows and Control by Banks, Families, and Corporations

D_{it} is the dependent variable in all the specifications. $D_{i,t-1}$, $L_{i,t-1}$, $L^2_{i,t-1}$ and CF are defined as in Table 6. $F_{i,t-1}$ is the proportion of voting shares held by a family, when a family is the largest shareholder of the firm at the ultimate level at time *t-1*, and equals zero otherwise. $B_{i,t-1}$ and $IC_{i,t-1}$ are similarly defined, but relate to the case when the largest shareholder is a bank and another corporation, respectively. Time dummies are included in all the specifications. m_1 and m_2 are tests for the absence of first-order and second-order serial correlation in the residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The Sargan test is a test for the validity of the instruments, asymptotically distributed as χ^2 under the null of valid instruments. Specifications (2), (4), (6), and (8) are GMM-instrumental variable estimators based on a GMM(SYS) procedure which consists of a linear system of first-differenced and levels equations. The set of instruments used are levels of dividends, cash flows, bank control, family control, control by industrial corporations, and proportion of voting shares held by the largest shareholder dated t-1 to t-4 for the differenced equations. For dividends and cash flows the instrument set is first-differences dated t-1 in the levels equations. For bank control, family control, control by industrial corporations, and the proportion of voting shares held by the largest shareholder the instrument set is dated t-2 to t-5 in the levels equations. Standard-errors, asymptotically robust to heteroskedasticity, are reported in parentheses. ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively.

	(a)		**(b)**		**(c)**		**(d)**	
	OLS	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Const.	0.004	-0.002	0.003	-0.003	0.003	-0.005	0.002	-0.004
	(0.009)	(0.007)	(0.009)	(0.007)	(0.010)	(0.012)	(0.010)	(0.011)
$D_{i,t-1}$	0.165**	0.101***	0.166**	0.098***	0.166**	0.102***	0.164**	0.103***
	(0.066)	(0.025)	(0.066)	(0.025)	(0.066)	(0.025)	(0.066)	(0.025)
CF_{it}	0.110***	0.117**	0.110***	0.117**	0.110***	0.117**	0.110***	0.117**
	(0.041)	(0.046)	(0.041)	(0.046)	(0.041)	(0.047)	(0.041)	(0.046)
$CF_{i,t-1}$	-0.034**	-0.023*	-0.034**	-0.022*	-0.034**	-0.023**	-0.034**	-0.023*
	(0.017)	(0.012)	(0.017)	(0.012)	(0.017)	(0.012)	(0.017)	(0.012)
$B_{i,t-1}$	-0.010***	-0.004	-	-	-	-	-0.010**	-0.007
	(0.003)	(0.009)					(0.005)	(0.010)
$IC_{i,t-1}$	-0.004	0.004	-	-	-	-	-0.004	0.004
	(0.004)	(0.007)					(0.003)	(0.008)
$F_{i,t-1}$	0.006*	0.020**	0.008***	0.020**	0.008***	0.019*	0.005*	0.018*
	(0.003)	(0.009)	(0.003)	(0.009)	(0.003)	(0.010)	(0.003)	(0.010)
$L_{i,t-1}$	-	-	-	-	0.006	0.023	0.010	0.023
					(0.009)	(0.033)	(0.010)	(0.032)
$L^2_{i,t-1}$	-	-	-	-	-0.008	-0.023	-0.009	-0.025
					(0.008)	(0.029)	(0.008)	(0.028)
m_1	0.354	-1.96	0.396	-1.97	0.421	-1.96	0.416	-1.97
m_2	1.074	-0.54	1.103	-0.58	1.116	-0.47	1.112	-0.44
Sargan	-	197.47	-	198.73	-	194.59		200.05
(p-value)		(0.995)		(0.248)		(0.998)		(1.00)
No. of Observations	3264	3264	3264	3264	3264	3264	3264	3264

Table 8

Panel Data Estimations of the Relation Between, Dividends, Cash Flows, Tax Discrimination and Control Structures at the First-Tier Level

The sample size is 214 firms. D_{it} is the dependent variable in all models and *CF* is cash flows, both scaled by the market value of equity at the beginning of the year. $TAX_{i,t}$ is a tax discrimination variable (see Section 4.3 for details about its calculation). $FNP_{i,t-1}$ $(F_{i,t-1})$, $BNP_{i,t-1}$ $(B_{i,t-1})$, and $ICNP_{i,t-1}$ $(IC_{i,t-1})$ are first-tier (ultimate) control (as a percentage) by domestic families, banks, and industrial and commercial corporations, respectively. Specification (1) estimates the impact of the tax status of shareholders in Germany on the dividend policy. Specifications (2) and (3) contain controls at the first-tier (2) and ultimate control (3) as additional explanatory variables. Time dummies are included in all specifications. m_1 and m_2 are tests for the absence of first-order and second-order serial correlation in the residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. Sargan is a test for the validity of the instruments, asymptotically distributed as χ^2 under the null of valid instruments. All specifications are estimated using GMM(SYS) which consists of a linear system of first-differenced and levels equations. The set of instruments used are levels of dividends and cash flows dated *t-2* and first-differences dated *t-1* to *t-4*. For the control variables $FNP_{i,t-1}$, $BNP_{i,t-1}$, and $ICNP_{i,t-1}$, the set of instruments is levels dated *t-2* to *t-5*, and first-differences dated *t-2*. For the tax variable, the instruments are levels dated *t-2* to *t-5*, and first-differences dated *t-1*. Standard-errors, asymptotically robust to heteroskedasticity, are reported in parentheses. ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	**(2)**	**(3)**
Constant	0.012	-0.002	-0.001
	(0.008)	(0.009)	(0.008)
$D_{i,t-1}$	0.097***	0.101***	0.097***
	(0.027)	(0.026)	(0.026)
CF_{it}	0.119**	0.118**	0.119**
	(0.047)	(0.047)	(0.046)
$CF_{i,t-1}$	-0.022**	-0.023**	-0.023*
	(0.011)	(0.011)	(0.012)
$BNP_{i,t-1}$	-	0.001	
		(0.018)	
$B_{i,t-1}$			-0.003
			(0.010)
$FNP_{i,t-1}$	-	0.013	
		(0.013)	
$F_{i,t-1}$			0.014*
			(0.008)
$ICNP_{i,t-1}$	-	-0.004	
		(0.007)	
$IC_{i,t-1}$			0.004
			(0.008)
$TAX_{i,t}$	-0.011*	-0.004	0.003
	(0.006)	(0.006)	(0.007)
m_1	-2.00	-2.00	-1.97
m_2	-0.65	-0.43	-0.53
Sargan (p-values)	201.46 (0.98)	182.70 (0.99)	196.31 (0.99)
No. of Observations	3264	3264	3264

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